NFARC Contest Computer Savvy

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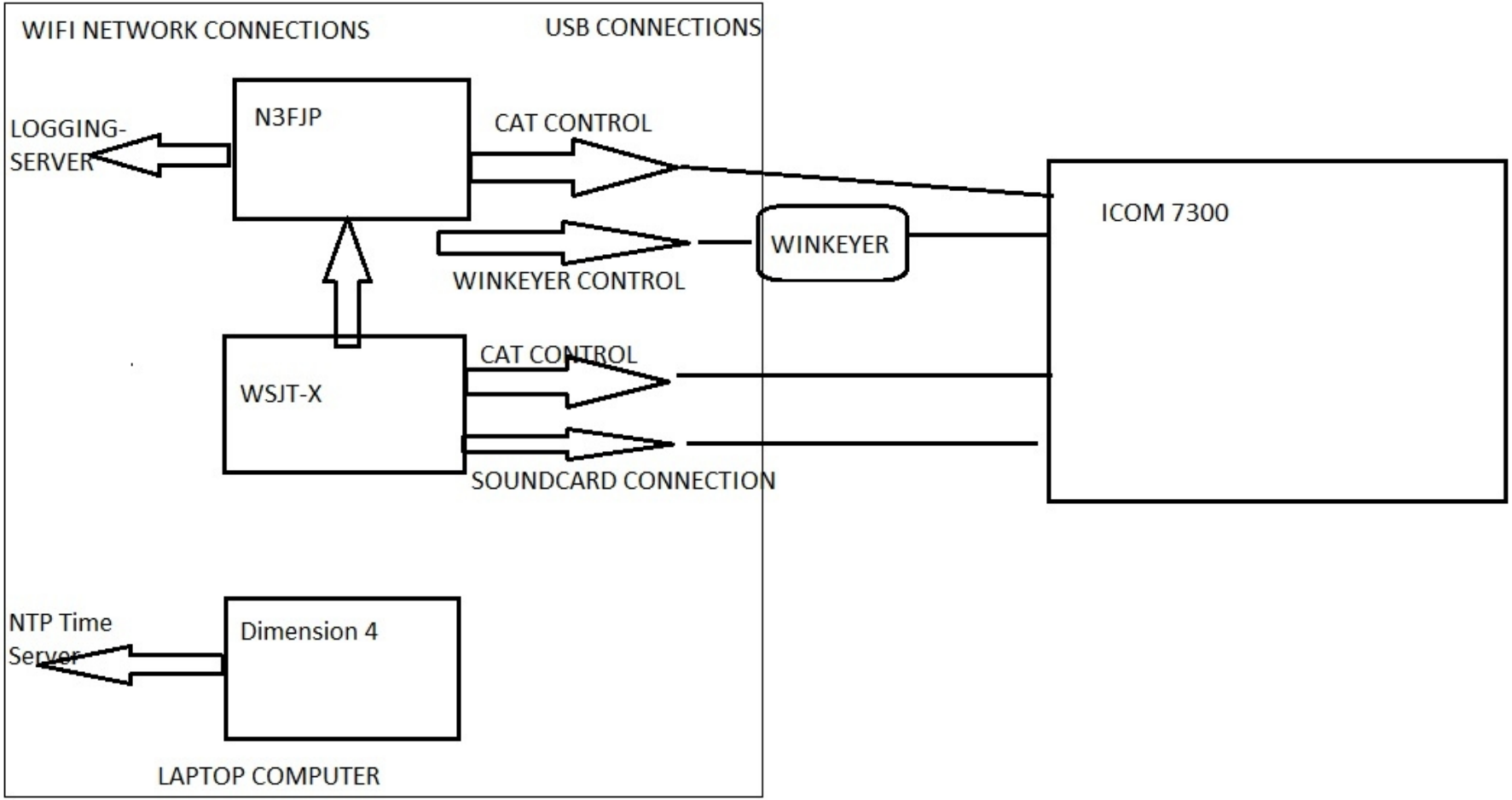
2024 TECHNITE Talk- April 4

You TOO can handle computers competently in the world of professional Emergency Management


WIFI NETWORK CONNECTIONS
USB CONNECTIONS
LOGGING-
SERVER
N3FJP
CAT CONTROL
ICOM 7300
WINKEYER
WINKEYER CONTROL
CAT CONTROL
WSJT-X
SOUNDCARD CONNECTION
NTP Time
Server
Dimension 4
LAPTOP COMPUTER

Skills

1. Logging into computer // username, password
2. Connecting to OUR network
3. TIME: Dimension 4 (primarily for FT8/FT4)
4. ICOM 7300 Connections A) CAT Control B) Soundcard
5. LOGGING: N3FJP
6. Helpful techniques for VOICE
7. Helpful techniques for CW
8. Helpful techniques for WSJT-X (Field Day only)

1- Logging Into Computer

- When turned on, WINDOWS 10 computers can recognize more than one username
- This allows some separation and security for personal computers
- Look for a Sticker with login information
- Example: USR NF4AC Ham   PW: NF4RC
- Try those!!

2- Connecting to Our Network

- TYPICALLY, NFARC operates on a “private“ network, that is, one that is NOT connected to the Internet.
- REASON: Security, and getting used to operating when the real Internet is GONE (one of our most important moments)
- Look for WAP (Wireless Access Point) information on a sticker on your computer or on a HANDOUT
- Example: Tenda02 with a PASSPHRASE
- To discover Wireless Access Points, click on the network icon (may be a GLOBE) in the right hand side of the TASKBAR at the bottom of the desktop. If the desired Access Point isn’t already listed, select “**Network and Internet Settings**“ → takes you to a STATUS page; there select the option “**Show Available Networks**“
- Once the desired Access Point is visible in the network list, select it, and provide the PASSPHRASE when requested. THIS CAN BE SLOW. The information under your desired Access Point should should change to show that there is “**No Internet**“ and offer the **DISCONNECT** button (proving you are connected) That is normal.

Operating on a Private, Non-Internet Network

- **You will not be able to get to normal web servers!** CNN and FOXNEWS won't be available. This is normal.
- Your logging computer WILL be able to reach other computers on the network (especially the Logging-Server)
- If your group has a private NTP (network time protocol) server, your computer will be able to get that
- (It is also possible that at times we will connect our network to the normal Internet.)

3- Time Server

- NTP (Network Time Protocol) is a famous Internet protocol for providing accurate time to any computer connect to the Internet.
- NTP is based on a significant number of TIME SERVERS located all over the world. Because of different delays (“latencies“) to different servers in different nations/continents, they may appear to have slightly different times.
- WINDOWS normally handles all of this in the background and doesn’t involve you at all.
- But WINDOWS time synchronization **isn’t always good enough**.

Our private NTP

- For our emergency services – that must still work when the Internet is down – and for compliance with requirements of some Contests / Exercises (e.g. Winter Field Day!) we can't be dependent on Internet time servers.
- Therefore, we developed (Jim Bledsoe and I) our OWN NTP SERVERS – Jim made it work on a windows computer and I got it to work on an older Raspberry Pi 2.
- Our NTP servers use **SATELLITE RECEPTION from GPS satellites** to get the time and use battery-backed up clocks inside the computers when turned "off" to keep relatively accurate time even then.

NTP connections on Windows Computer

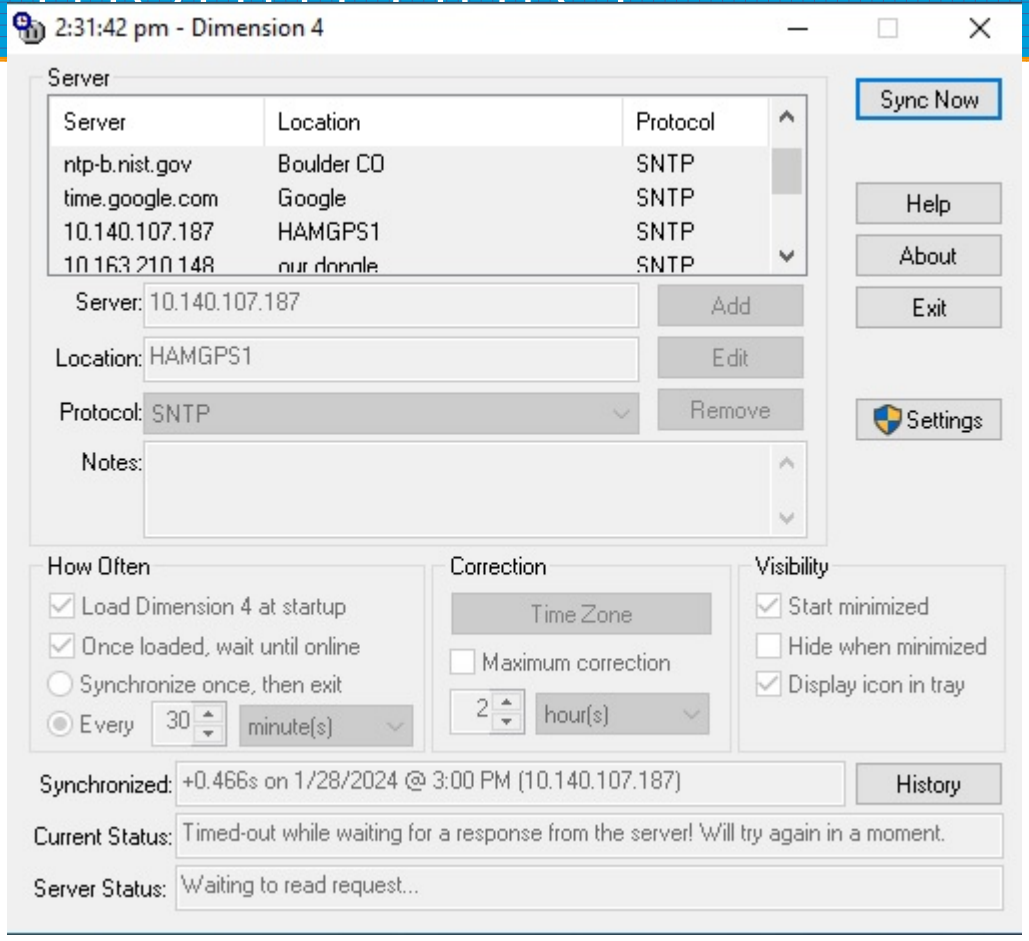
- In addition to WINDOWS internal software (w32time) to connect to time servers, there are MULTIPLE third-party time synchronization systems.
- Dimension 4
- Meinberg
- NetTime
- And many others
- In order to use a 3rd party software, you will be asked if it is OK to disable the internal Windows software (w32time)

Dimension 4

- Many hams use Dimension4 It isn't perfect, but it generally works and makes it very easy to control how often and where one synchronizes.
- NORMALLY, Dimension 4 cycles through a huge list of potential time servers, and synchronizes occasionally (like, maybe every hour?)
- FOR FT8/FT4 with our own private NTP server (and usually NO CONNECTION to the Internet) we have to adjust the Dimensions 4 settings.

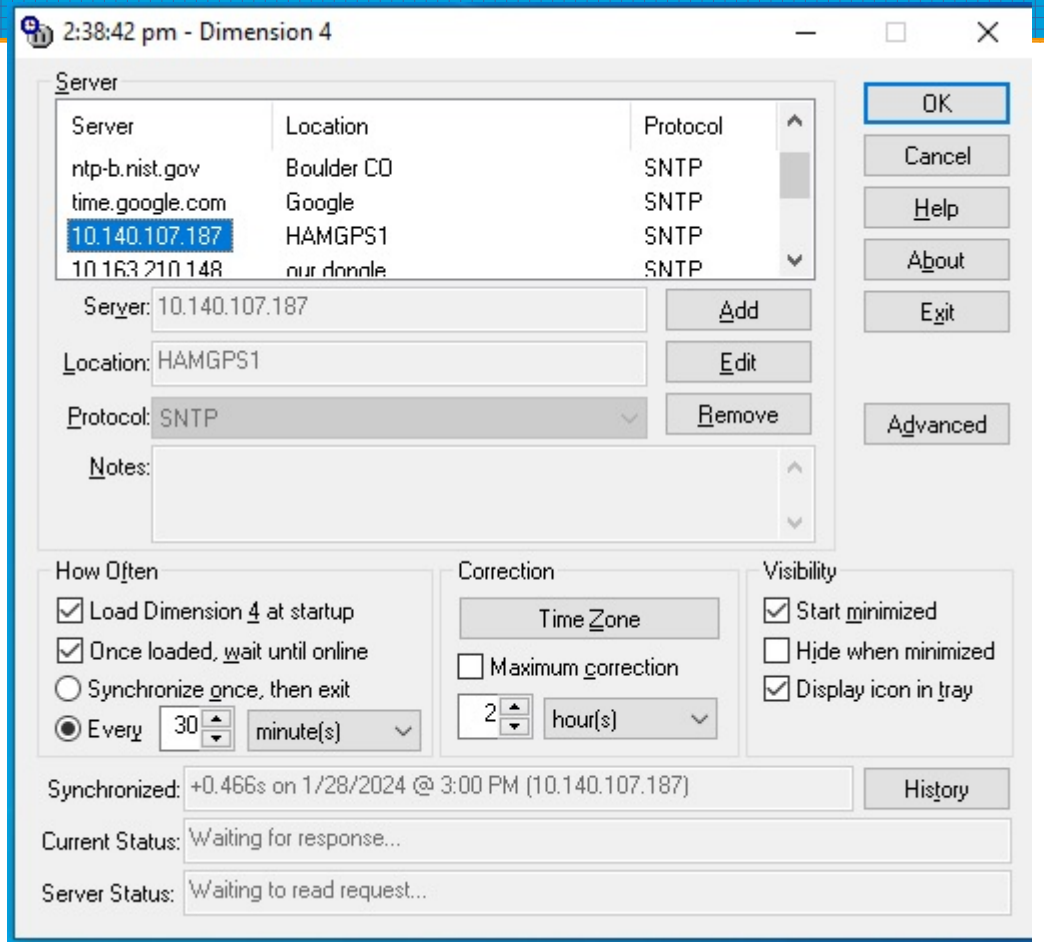
Contest Settings…months later!

- This is how Dimension4 looks when it was set up for Winter Field Day – and hasn't been returned to „"normal" since!
- Because it can't GET to the private NTP server, it is way out of time.
- Do you see the clues?



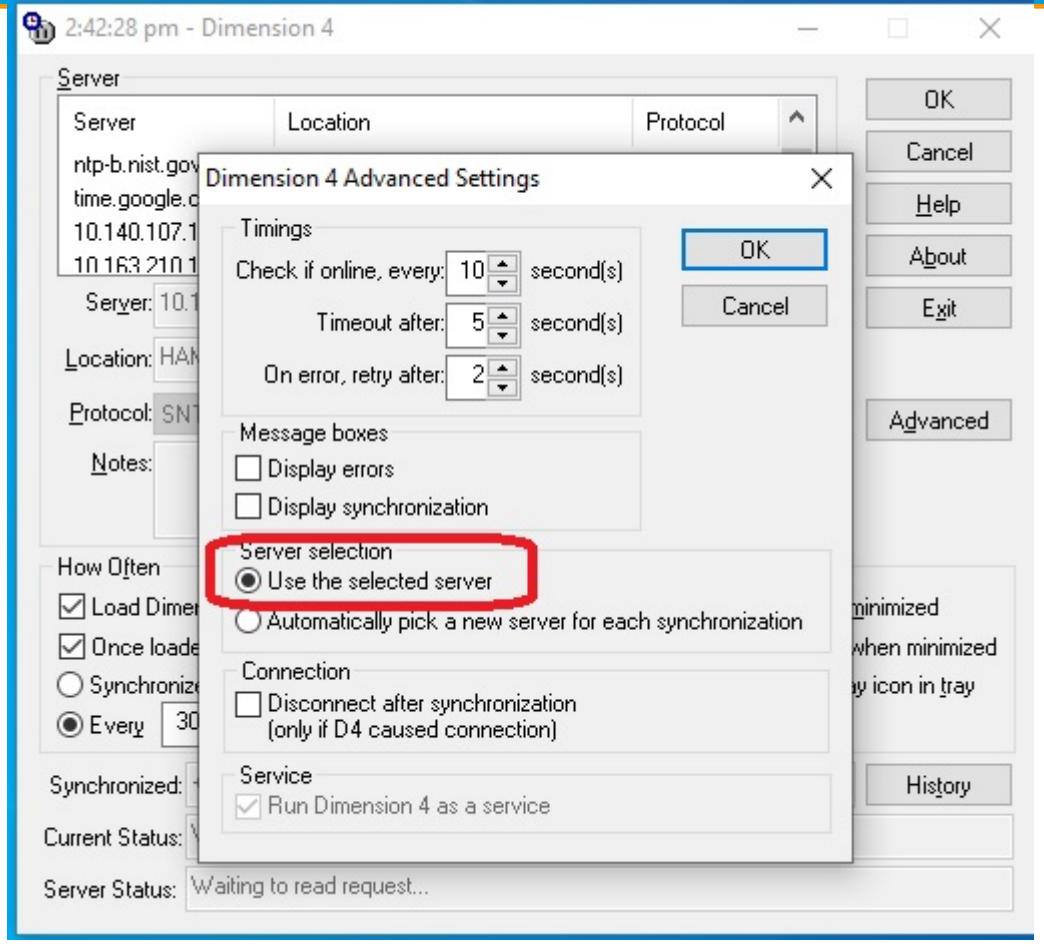
Click on SETTING

- (This may require Administrator privileges)
- Note the client will synch every 30 minutes, and is pointing current at HAMGPS1 on 10.140.107.187
- (and hasn't been able to connect since 1/28/2014!)



Advanced Settings

- Advanced Settings is where we restricte the time server to our own private server.
- Once the contest was OVER, we should have told it to “Automatically pick a new server for each synchronization“



NTP Server Success

- **Our private GPS-satellite server has been a huge success**. It maintains accurate time for hours even with just a few minutes of Satellite access.
- Earl ran it from a battery-backed up system and we merely carried it outside at the beginning of Winter Field Day
- (and were so busy we forgot to do it again….and it still worked perfectly)
- Normally you would allow it to see the GPS satellites at least once a day. (Or if your DT figure on decoding FT8/FT4 crept up past about 0.4-0.5 seconds)

4-Connecting to ICOM 7300
(A) CAT control

- SOME of our software need to communicate to/control the RADIO.
- This is done via a USB (universal serial bus) cable that looks like a “printer cable“ that goes from a USB port on the computer to the USB jack on the back of the ICOM 7300
- ONLY ONE piece of software can have CONTROL of the Icom 7300 at a time. The USB PORT can be used by only ONE piece of software at a time.
- MORE THAN ONE modem can “listen“ to the soundcard of the 7300...but only ONE should be trying to transmit.

Software that likes to control the ICOM

- WSJT-X (FT8/FT4) really likes to have control of the ICOM – it reads frequencies, sets frequencies, turns on and off transmissions using CAT (computer aided transceiver).
- N3FJP sometimes likes to have control of the ICOM – you can activate canned voice or canned CW directly from N3FJP function keys [huge streamlining of your operation!] and it sorta likes to eavesdrop on your mode and frequency (optional)
- So going back and forth between DIGITAL and CW or VOICE requires some understand of “letting go“ and detecting what happens when you forget to turn off one piece of software before starting another, causing contention for the port.

ICOM driver software

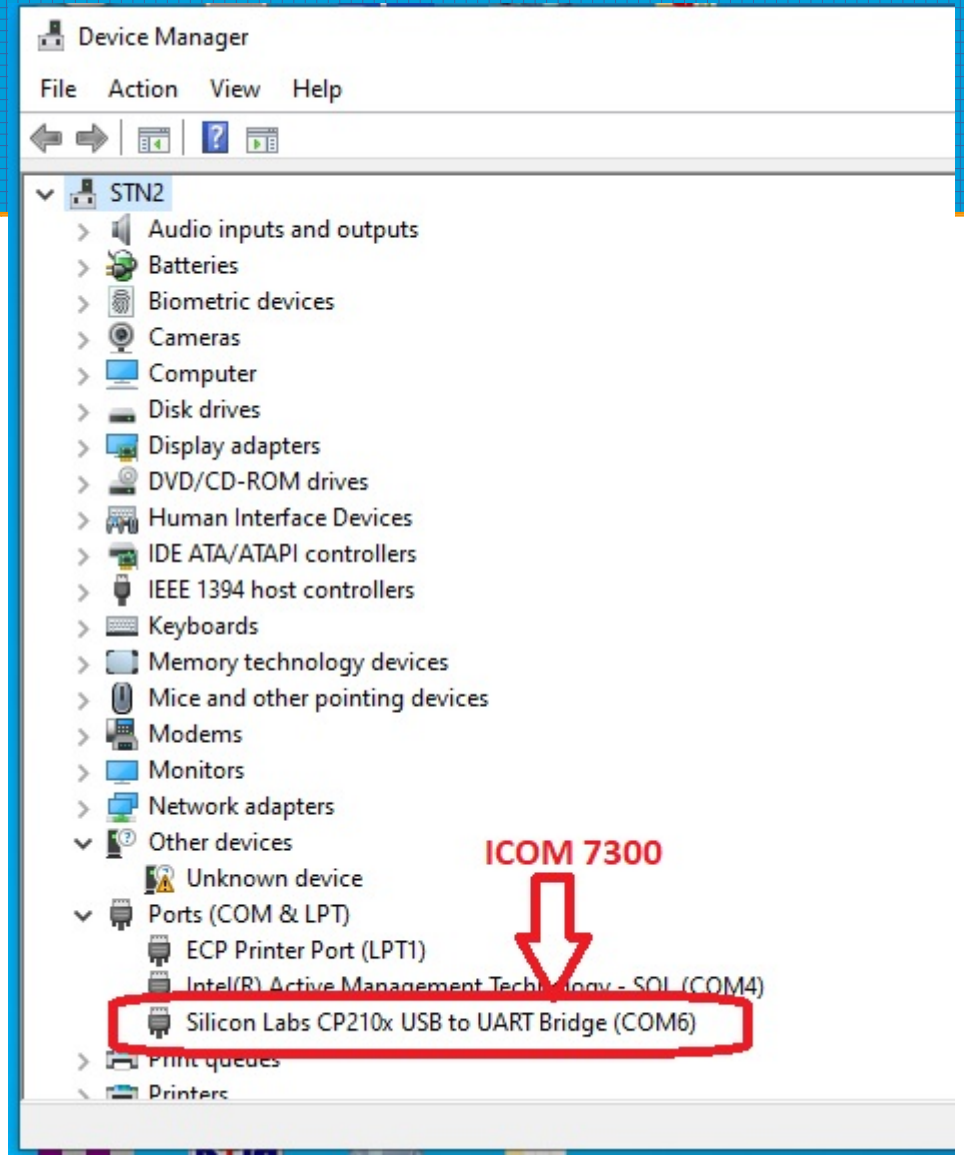
- You can access the SOUND CARD audio in the ICOM 7300 without adding any software to your computer. Windows sees it as a generic sound card and will happily listen to it.
- You cannot read / control frequencies or any other CAT – type feature without loading ICOM specific driver software (available freely on their web site e.g. https://www.icomamerica.com/support/firmware_driver/)
- You MUST have this software driver installed in order to use CAT commands from WSJT-X or N3FJP or anything else!

DEVICE MANAGER

- Windows Device Manager is a key piece of built-in software that helps you identify how the ICOM is connected, the PORT NUMBER etc.
- You should be very familiar with simple usage of Device Manager.
- You can get to it through the Settings | search box: Device Manager
- You can get to it by typing Device Manager into the Cortana search in the bottom left taskbar.
- There are probably many other ways to get to Device Manager.

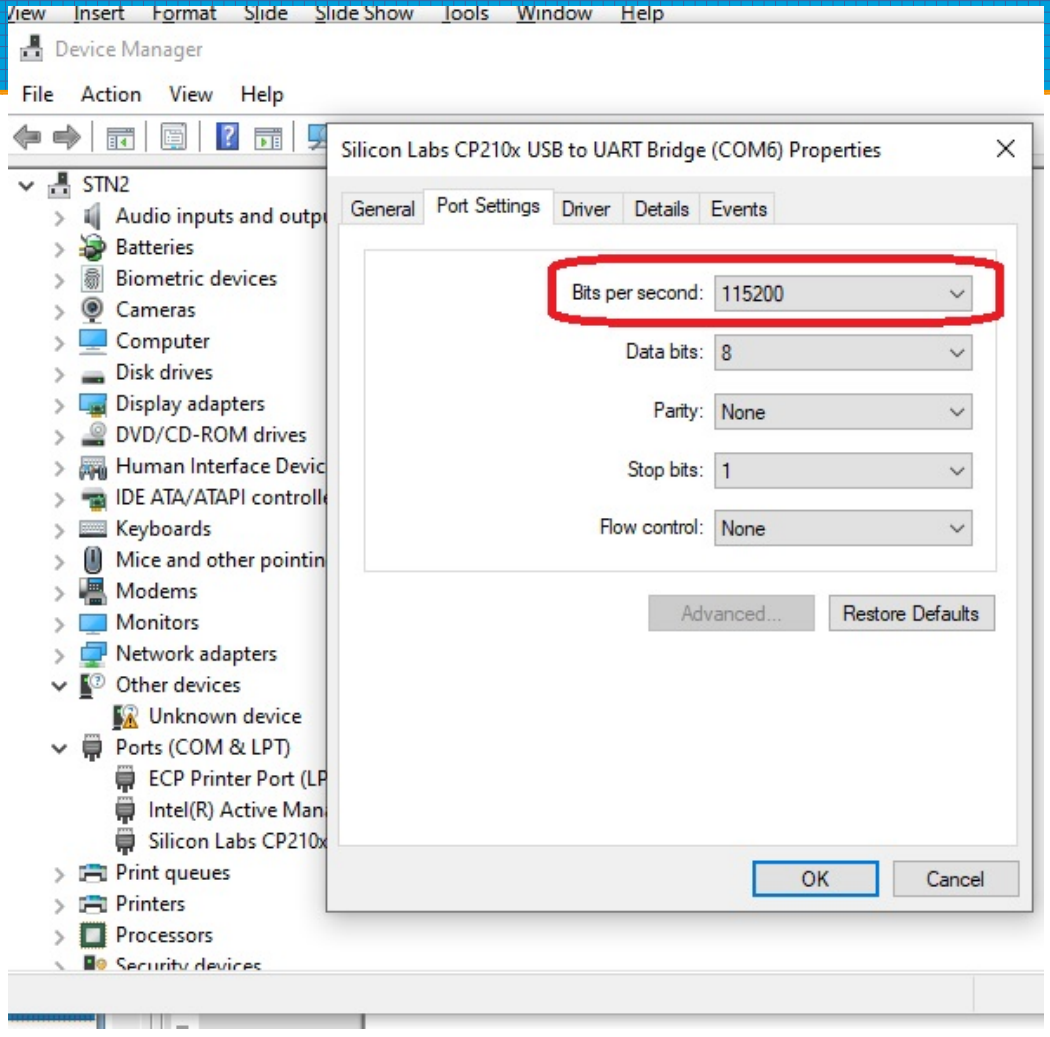
Finding ICOM7300

- ICOM7300 will show its CAT connection under PORTS (if it is there)
- Always Silicon Labs CP210x
- The COM PORT number is given (6 in this case) – you will need that to match in N3FJP or WSJT-X to connect to the radio properly.



BitsPerSecond

- Additional detail can be found by clicking on the Silicon Labs line
- Most important is the Bits Per Second (connection speed)
- MOST of our computers and ICOMs work fine if this is set to 115200 (quite fast) – ICOMs can be set for “auto-baud“ and will automatically adapt to whatever speed your interface uses



Radio Side of Things – ICOM

- *The RADIO has a vote in all of this*. Particularly speeds must be compatible
- Press **MENU**
- Touch **SET**
- Find **Connectors** and touch that
- Find **CI-V** and touch that ("Computer Interface 5" – pretty solid since 1980's)
- Find **CI-V USB Baud Rate** – suggest **AUTO**
- Same menu – see CI-V Address – usually 94h (94 hexadecimal)
- Yaesu / Kenwood / Other – will be DIFFERENT. ICOM is usually the easiest.

Testing CAT connections

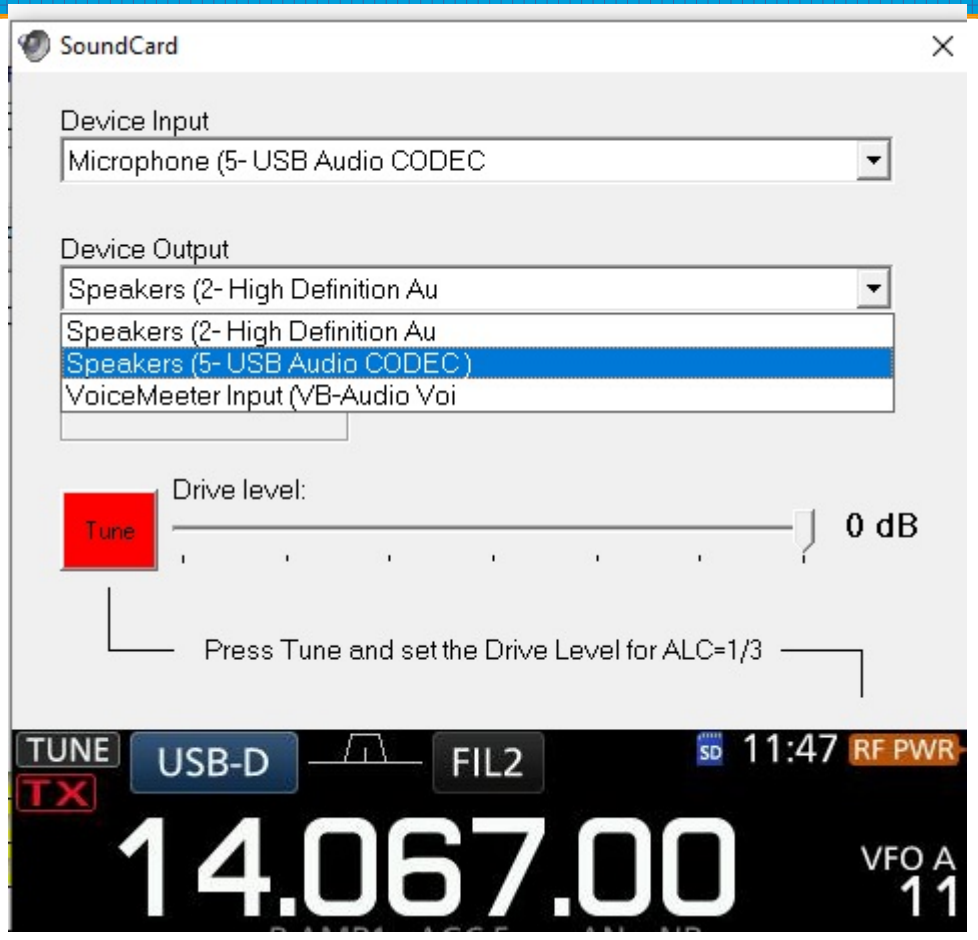
- Often when you plug in USB connectors you'll get a "happy" musical note, suggesting that the driver was found and worked. This doesn't prove that your software will work, but it is a start.
- If your port doesn't show in Device Manager….something is wrong.
- Once you get your SOFTWARE APPLICATION also properly configured, you should be able to read or change the frequency of the radio, etc., from the Application – this is the proof of a working CAT connection.
- SOUND is completely separate!

4 – Connecting to the Icom 7300
(B) Soundcard

- “Soundcard“ comes from legacy computers that came with no audio capabilities other than a buzzer-speaker. A physical printed circuit board “card“ had to be installed into a long slotted jack in the computer and mic/speaker connections were then available and useful.
- These days, every computer has this built-in and additionally, RADIOs have their own equivalent of a „“soundcard“ already connected to their speaker & mic.
- You just need to connect your APPLICATION to the Radio’s SOUNDCARD
- This is usually only necessary for DATA techniques, not CW or Phone

Connecting to the Radio's "Soundcard"

- This is now fairly standardized in all Windows-based data applications.
- SOUNDCARD will show up in some menu.
- INPUT and OUTPUT will need to be selected.
- Find something that includes the words USB and CODEC and you are golden.



Verifying soundcard connections

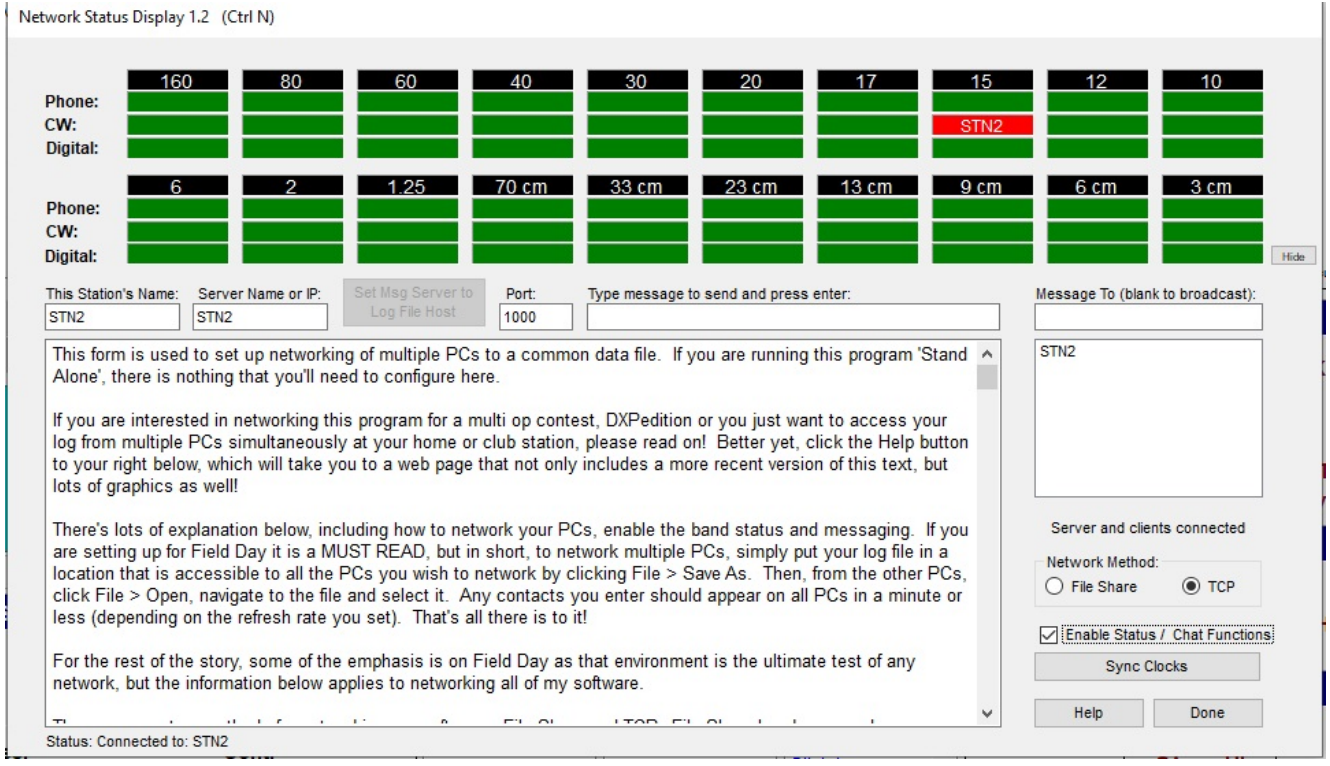
- You should be able to SEE audio on the receiving side (waterfall, gauges, etc) when there are signals being received by the radio.
- Signalink-connected data signals should transmit when desired (Signalink detects audio and closes the PTT to ground by itself)
- Non-Signalink-based transmissions (e.g. ICOM7300-based) require CAT connections to activate TRANSMIT, so may not transmit without this also working
- Remember, it is possible to have MORE THAN ONE application “receiving“ from the same soundcard. For example, receiving ARRL Bulletins, you can run THREE copies of FLDGI connected to the same radio: one set for MFSK16, one set for PSK31 and one set for RTTY-45! No matter which technique they use, you can decode it!

Logging: N3FJP

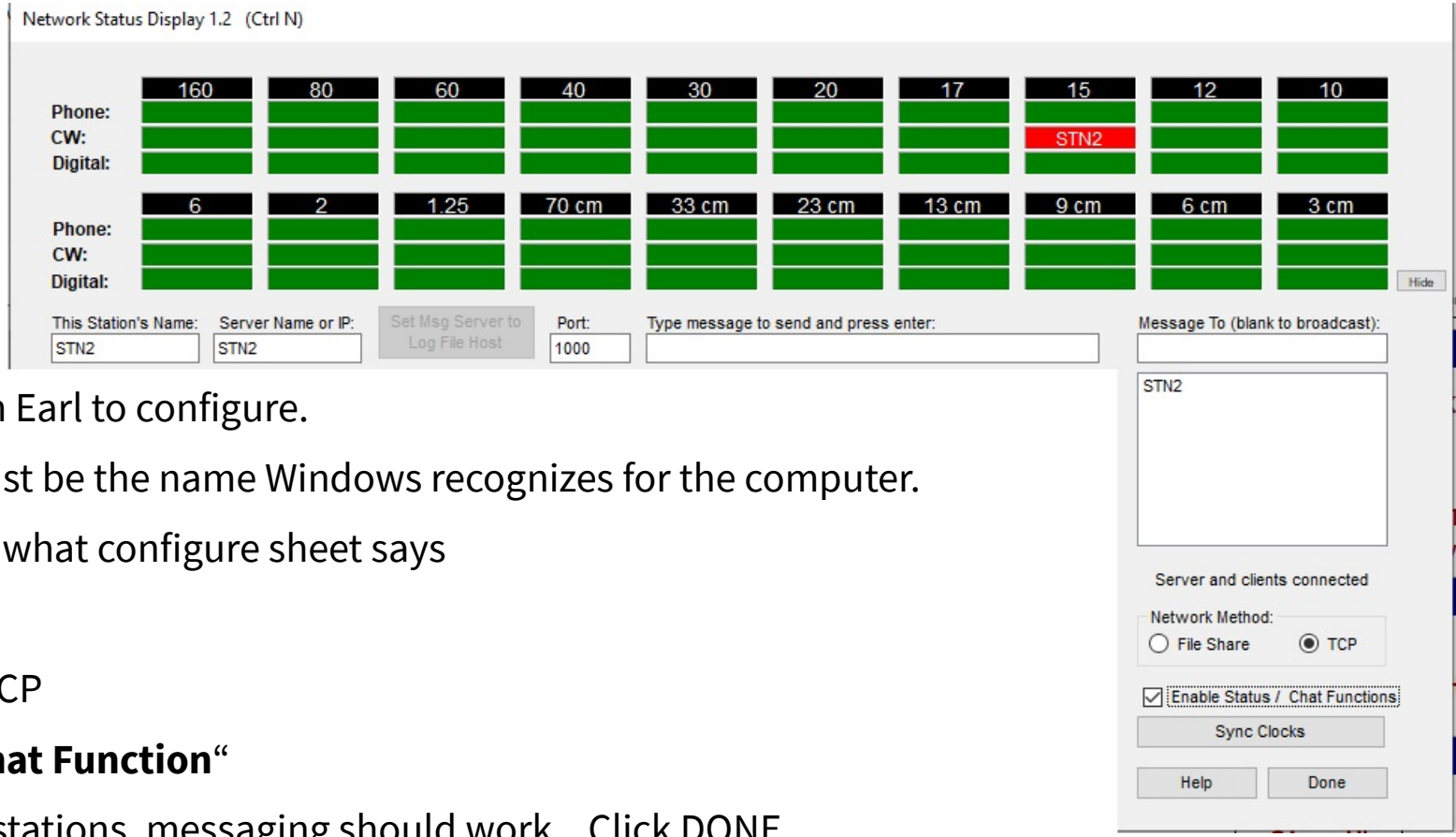
- Start the appropriate N3FJP product.
- Enter your callsign and initials so you get “credit“ for your contacts (if you don’t care, just put in my callsign and initials so I can outdistance W4JIR!!)
- Click the correct BAND and MODE so your contacts get listed properly. [program may connect to radio, but manually is more guaranteed]
- **Making sure the logging program is connected to the Logging-Server is the most important check.**

N3FJP: Networking 1

- Find the “Networking“ menu option (sometimes on the top menu, sometimes under Settings)
- Seeing your station & others in RED on the band/mode display is strong indication you’re connected!



N3FJP Networking 2



- Need settings sheet from Earl to configure.
- **This Station's Name** must be the name Windows recognizes for the computer.
- **Server Name or IP**: use what configure sheet says
- **Port** is always 1000
- **Networking method:** TCP
- Click "**Enable Stabus/Chat Function**"
- Display should show all stations, messaging should work. Click DONE

N3FJP: Troubleshooting networking

- First check that you're really on our network.
- Verify that your Dimensions 4 can "sync"
- If networking is failing, try the Windows Network Troubleshooter (generally it will restart network connection devices, often fixing the problem) or get help.

6 – Helpful VOICE hints

- The ICOM 7300 can record small voice snippets and play them back into the transmitter.
- When recording, work to get the audio at correct volume. System provides some adjustments for this.
- 7300 can automatically “repeat“ the first message (useful for running CQ) after a chosen set of seconds (Maybe 4 seconds?)
- Accessed via MENU | SET | VOICE – but requires hitting a touch-screen soft-key. BE CAREFUL WITH FINGERNAILS to avoid damage to an expensive screen!
- **Easier to have N3FJP activate it!**

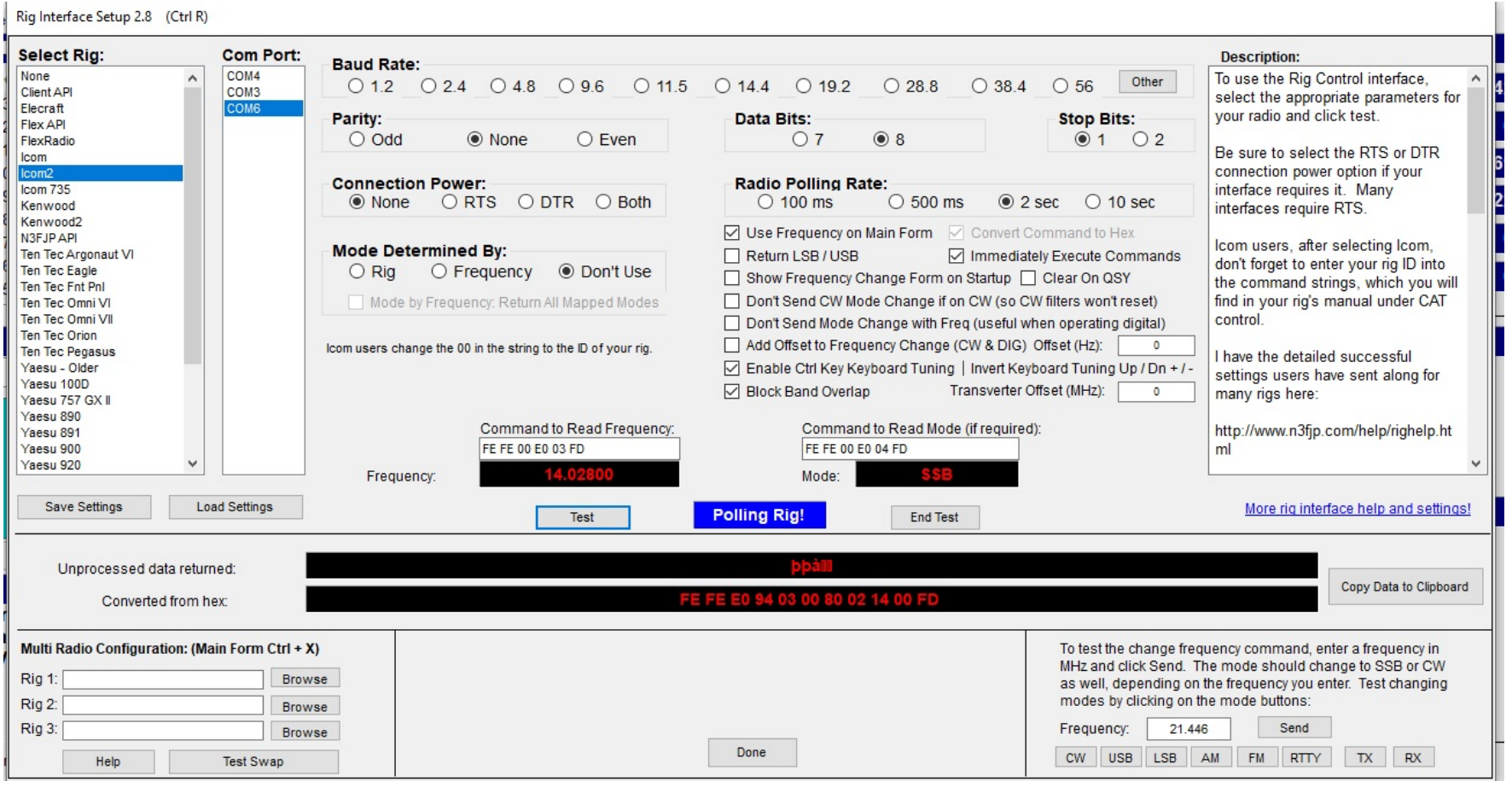
Advantages of using N3FJP to activate

- You never have to move your hands to rig to activate a canned voice
- No risk of scratching the touch screen with long fingernails (these are SOFTKEYS)
-
- However, requires N3FJP to have RIG INTERFACE connected and working (hence….in control….can't have WSJT-X or anything else still connected, right?)

N3FJP Keyboard Activating 7300 Voice

- With version 1.3, I have added the ability to play saved voice recordings stored in your rig (for rigs equipped with this feature). To send a command instead of playing a wave file, precede the command with RI:. For example, when placed in an F key string, the following will trigger the Icom 7300 and Icom 7610 internally recorded voice messages: (you must have rig interface enabled and be connected by a com port).
- **Stop xmit RI:FEFE00E0280000FD**
- **Play mem 1 RI:FEFE00E0280001FD**
- **Play mem 2 RI:FEFE00E0280002FD (and so on...)**
- Of course, users of other Icom rigs will replace the 94 with the rig ID for their rig and users of other rig manufacturers will use different commands entirely. Consult your rig's manual to see if your rig supports this feature and find the appropriate commands.
- For RI: commands, Loop Sec delay must be longer than recorded audio length in rig memory, or there will be no delay. If you would like to be able to stop your audio transmission in mid playback, optionally use another F key to program the appropriate Stop command for your rig.

N3FJP Rig Interface



N3FJP Rig Interface

- Device Manager to find the COM PORT
- Try 115200 speed (has to be manually entered)
- Leave other stuff alone
- Click TEST and see if you get data on frequency!
- I poll every 2 seconds.

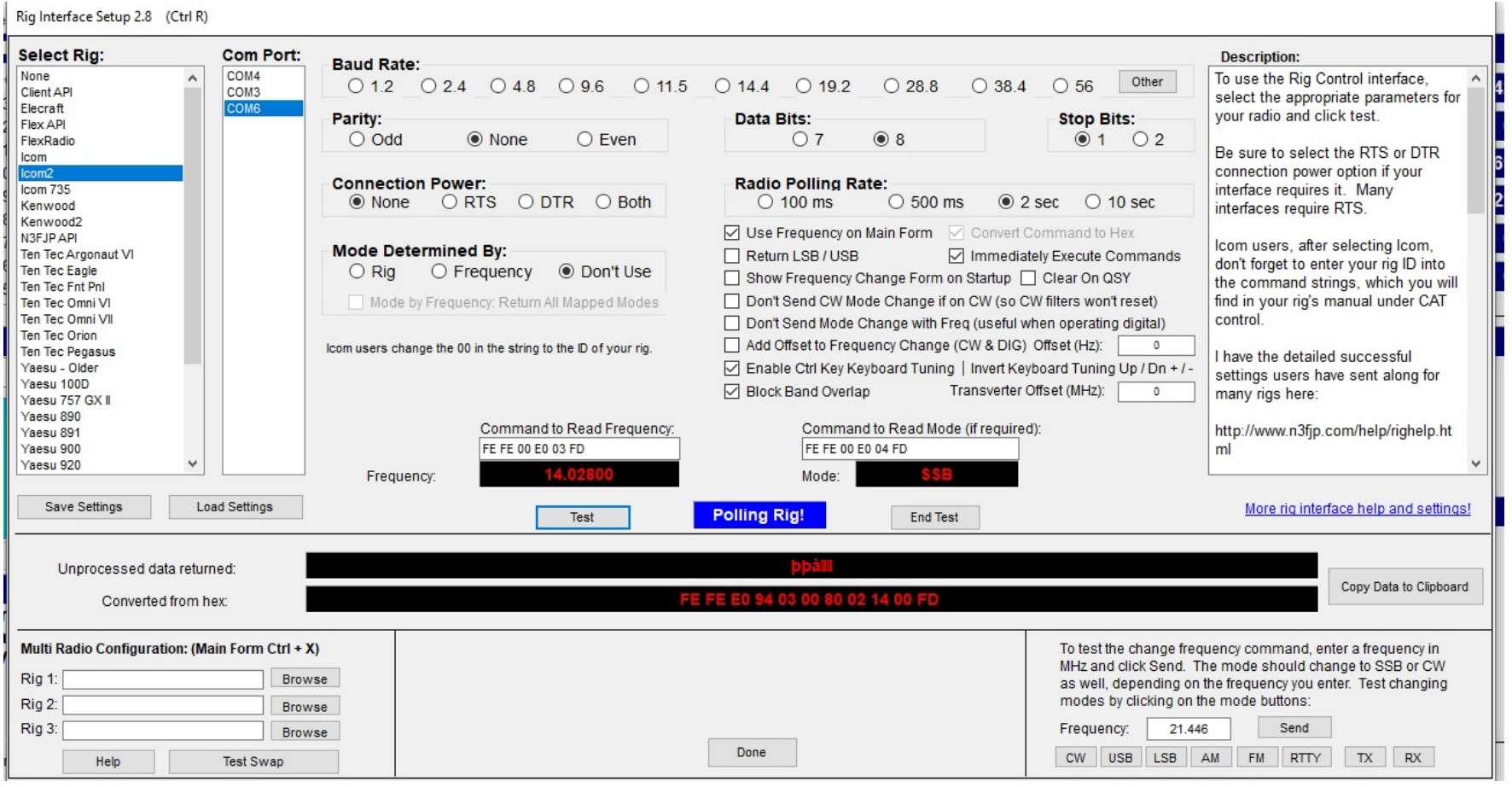
For more voice suggestions

- https://qsl.net/nf4rc/2023/FieldDay2023/SSBContactSuggestions.pdf

7 – Helpful Techniques for CW

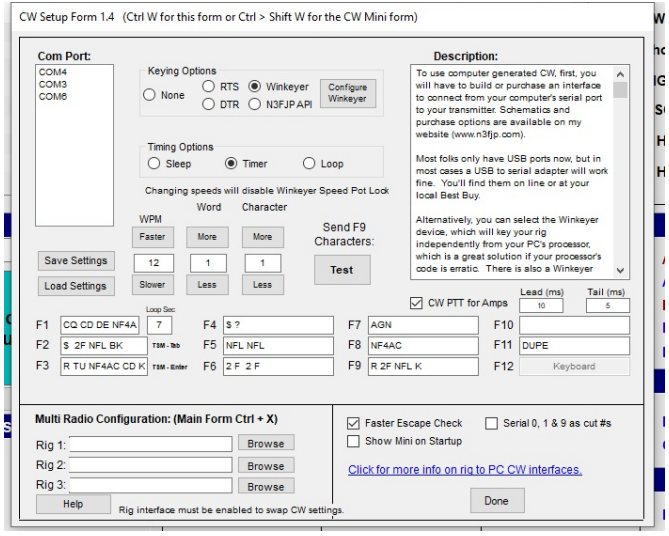
- For CW, N3FJP is a lifesaver. It can allow you to send everything you need, merely by clicking FUNCTION KEYS, which will send exhange, confirmation – any canned text you like.
- You CAN do this inside the 7300 alone….but it is much less helpful because it doesn't know the CALLSIGN of the person you're in contact with. N3FJP does, and can insert that for you!
- HUGE benefit keeping your hands to stay PUT in one place

Requires Rig Interface (again)



Multiple Ways to do this

- If you don't have a winkeyer, you have to have N3FJP make CW contact closures
- This is done by using RS232 equivalent „DTR" or „RTS" signaling (not by actually closing any contacts)
- The 7300 can be set to allow one of those to be „CW straight key" and the other to be „push to talk button"
- (This is done in MENU | SETTINGS | CONNECTIONS | ….)
- It works --- but the timing can be erratic. N3FJP provides options for several timing techniques and trial and error is needed to find the best for YOU.



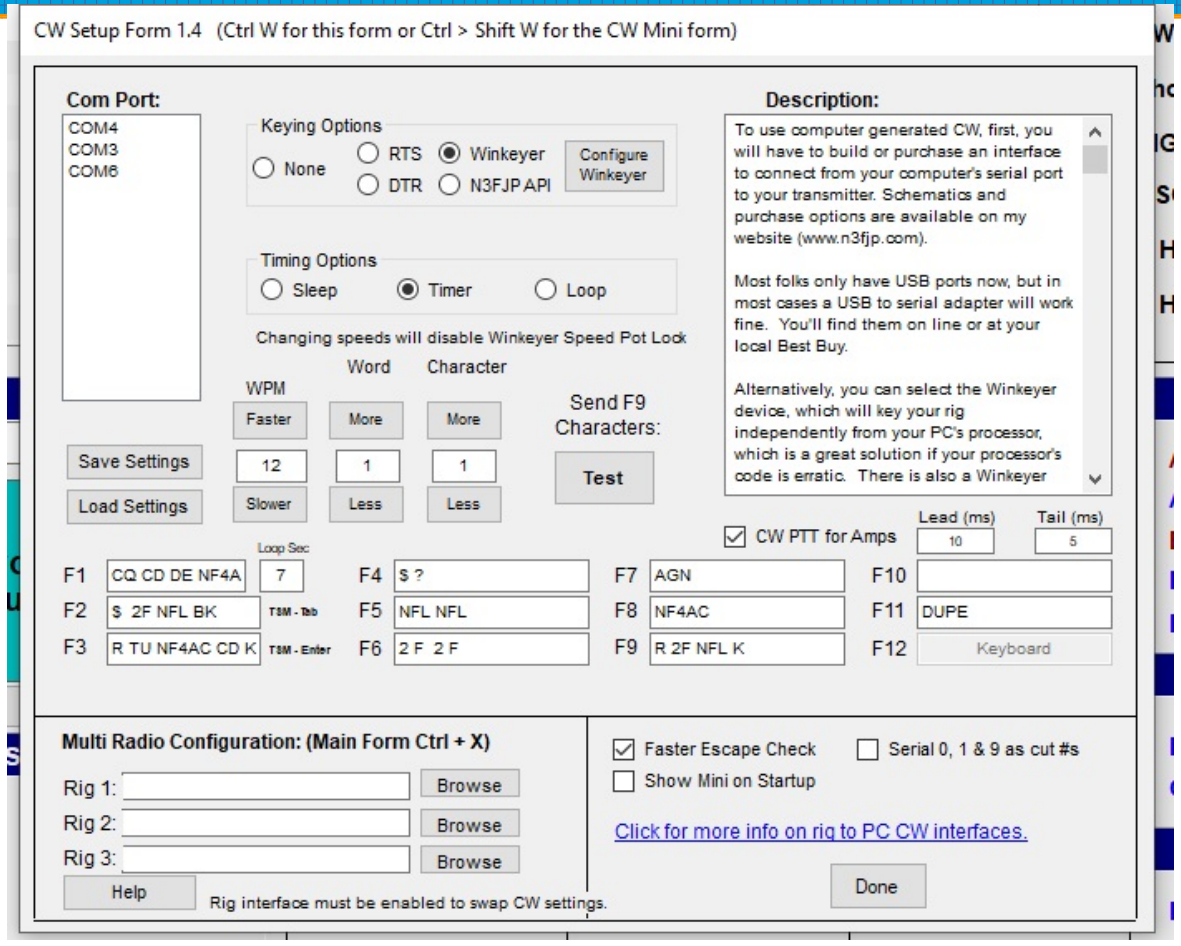
Better Technique: Winkeyer

- The commercial WINKEYER device is the morse code equivalent of a hardware modem like the PACTOR
- Instead of the laptop sending the dots and dashes, it just tells the WINKEYER what ASCII characters to send….and the hardware Winkeyer does all the timing and literally closes contacts (acts like a straight key!)
- Set the 7300 to use „straight key“
- Code is flawless as a result.
- DIFFICULTY: requires yet another USB/ComPort connection and some users have difficulty making it „work“ for significant lengths of time. It has GENERALLY be a huge success for ME.

Requires “Configure WINKEYER“

Configuration of WINKEYER is somewhat odd.. **extensive** testing resulted in appendix to this document: https://qsl.net/nf4rc/2023/FieldDay2023/CWContactSuggestions.pdf

Looks like there is a CW.cws file that the program reads on startup…. Huge advantage if that has been SAVED after configuring the WINKEYER properly!!



Appendix

- The appendix in that document
- https://qsl.net/nf4rc/2023/FieldDay2023/CWContactSuggestions.pdf very carefully describes how the N3FJP CW keying works with WINKEYER in a variety of user-conditions
- Describes the ones that work most reliably!
- Suggest you follow that document if you have a WINKEYER
- There is a commercial 2nd source that uses the same chip
-

8- Helpful Techniques for WSJT-X

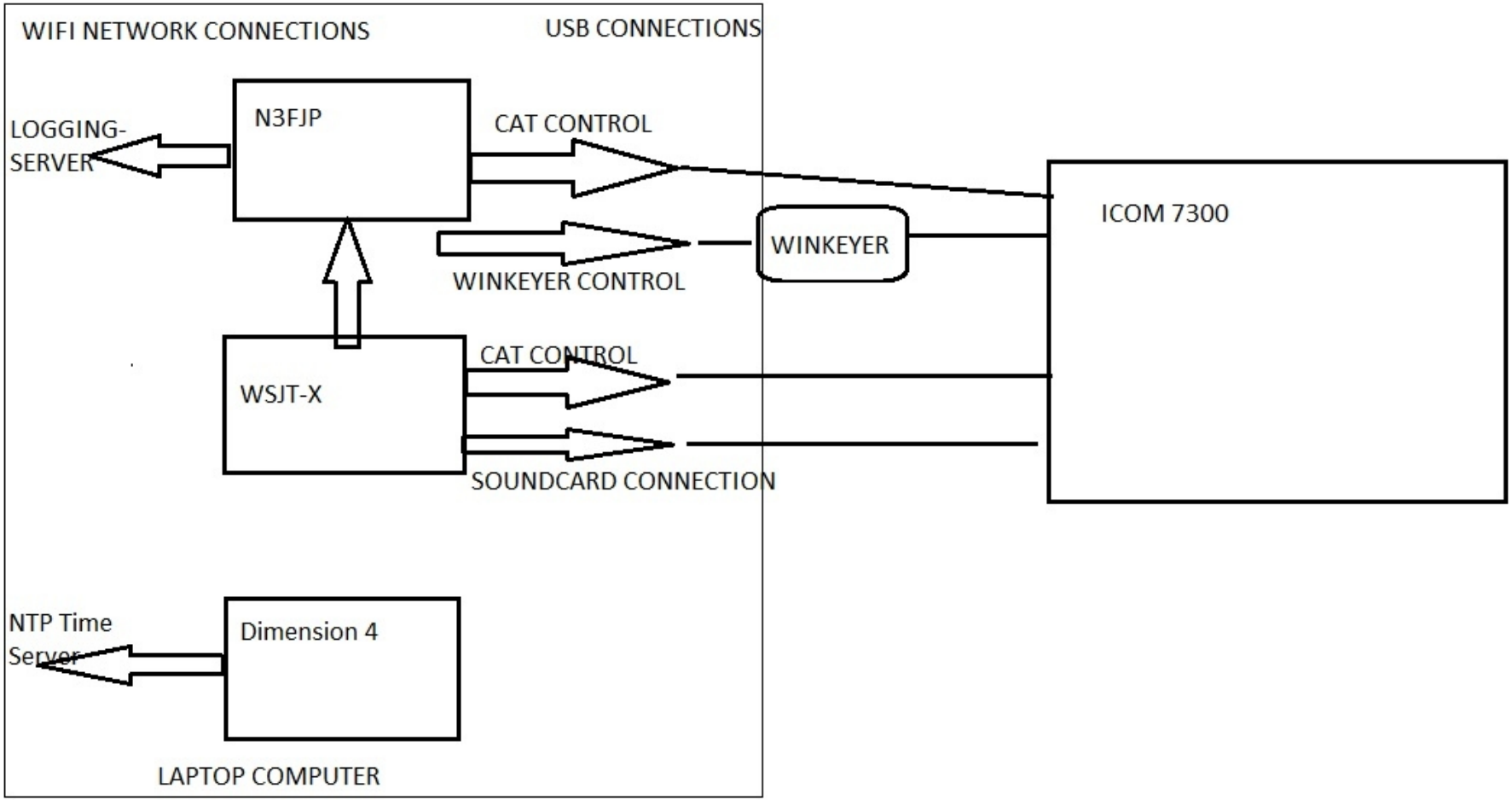
- Program operates a „modem“ (to create FT8 or FT4) and naturally requires SOUNDCARD settings to be selected properly
- Program controls ICOM7300 via CAT – and hence requires COM PORT!!
- You must remember to disconnect anything ELSE that had a COM PORT connection to the 7300 (**e.g. N3FJP sending voice or cw**)

For additional information

- https://qsl.net/nf4rc/2023/FieldDay2023/FT8FT4ContactSuggestions.pdf

For additional information – PSK etc

- https://qsl.net/nf4rc/2023/FieldDay2023/PSK31RTTYContactSuggestions.pdf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